

Remarks

The following remarks are provided in further support of the Claims.

Rejections

Rejection Under 35 U.S.C. §102

Claims 1-11 are rejected under 35 U.S.C. §102(a) as being anticipated by Waggoner et al. ("Self-assembled columns..." in JACS 123 (3) 496-7 (2001).

Claims 1, 3-7, 9 and 11 are rejected under 35 U.S.C. §102(e) as being anticipated by Safinya et al. (US 6,358,523).

Claims 1-7, 9 and 11 are rejected under 35 U.S.C. §102(e) as being anticipated by Firestone et al. (US 6,537,575).

I. DISCUSSION - 35 USC §102(a) (Waggoner et al) Claims 1-11

Applicants submitted a declaration under 37 CFR §1.132 showing that, to the extent the disclosure in the paper of Waggoner et al. is a disclosure of the present invention claimed in the above-identified patent application, the co-author P. Kotula of the paper was working under direction of the one or more of the inventors of the Applicants' invention. The declaration establishes "that the article is describing applicant's own work" as required by MPEP 2132.01. The declaration is also provided by all of the inventors. Therefore, the cited reference is a publication of Applicants' own invention published less than one year prior to the filing date of the instant Specification and can thereby be removed as a reference according to MPEP 716.10 for rejection of claims 1-11.

In the USPTO Advisory Action, the Office has indicated that the declaration is satisfactory for overcoming the section 102(a) rejection over Waggoner et al. Applicants request that the original declaration previously submitted be considered as being submitted with this Amendment.

II. DISCUSSION (Rejection Under 35 USC 102(e), Safinya et al., '523

Safinya et al. teach charged multilamellar macromolecule-lipid complex comprising lipid layers interspersed with macromolecules (such as DNA). As shown in FIGs. 3 and 5A of Safinya et al., lipid bilayers are interspersed with macromolecules such as DNA molecules. The lipid bilayer material extends two dimensionally (e.g., laterally) without any set boundaries, with the lipid bilayer molecules extending laterally as well as vertically. Moreover, FIGs. 3 and 5A illustrate the lack of definitive boundaries by showing the lipid bilayer structure as a rectangular stack of material. These structures are microns wide (see FIGs. 3A and 5A) due to the lateral extent of the structure.

In the present invention, lipid bilayer materials self-assemble by stacking or layering themselves one upon another in a stacked, columnar structure (see Specification page 5, lines 12-22). The structure is a rod-like shaped structure (see Specification, page 3, lines 20-25). The maximum diameter of the columnar structure, and therefore of the discrete lipids, is 900 Angstroms (see Specification, page 7, lines 15-17). Therefore, the present invention differs from Safinya et al. in that (1) the lipid bilayer materials layer themselves upon one another where Safinya et al. lipid bilayer materials are two-dimensional structures where the molecules adhere to each other both laterally as well as vertically, with a mass of molecules forming layers with macromolecules interdispersed between the layers and (2) the lipid bilayer materials stack in a columnar structure with a maximum diameter of 900 Angstroms (where columnar, according to "The American Heritage Dictionary," Houghton Mifflin Company, 1985, means 'having the shape of a column' and column means 'a supporting pillar consisting of a base, a cylindrical shaft and a capital') where the Safinya et al. lipid bilayer materials form a layer of undefined dimensions that extend laterally much greater than 900 Angstroms without a priori bounds to give a multi-micron dimensioned structure. Therefore, the columnar structure of the material of the present invention is implicitly and approximately cylindrical (although not necessarily exactly cylindrical as the material preparation can not provide an exact geometry but only an approximately cylindrical or rod-like material) with a maximum diameter of 900 Angstroms.

Therefore, Safinya et al. does not provide the elements of a plurality of lipid bilayer molecules, each lipid bilayer molecule layered upon another lipid bilayer molecule, in a stacked columnar rod-like shaped structure of less than a maximum of 900 Angstroms in diameter, as specified in claims 1, 3-7, 9 and 11 of the present invention.

III. DISCUSSION (Rejection Under 35 USC 102(e), Firestone et al., '575

Firestone et al. teach a mixture which is a combination of a lipid, a polymer-grafted phospholipid and a surfactant. The mixture is a gel at certain temperatures and a liquid at other temperature intervals. As depicted in FIG. 3 of Firestone et al., the mixture self-assembles in a micellar arrangement with the lipids, phospholipids and surfactants oriented in a circular fashion. In particular, the lipid materials orient with one end of the lipid molecules along the circular periphery and the other end oriented toward the center of the micelle. The micelles organize into a roughly rod-like or cylindrical structure. The micelles do not layer upon one another to form a rod-like structure. Firestone et al. teach a lattice spacing of the liquid phase of several hundred angstroms (e.g., 345 angstroms, Col. 7, line 54) but the cylindrical structure comprising the lattice elements are not lipid bilayer materials layered one upon another, as taught by the present invention and specified in claim 1 of the present invention. As described above, the cylindrical structures are mixtures of components where the lipid bilayer materials do not stack one upon one another but are oriented in a self-assembled fashion within micelle-like structures in a circular arrangement. In the present invention, lipid bilayer materials self-assemble by stacking themselves one upon another in a stacked, columnar structure.

Therefore, Firestone et al. does not provide the elements of a plurality of lipid bilayer molecules, each lipid bilayer molecule layered upon another lipid bilayer molecule, in a stacked columnar rod-like shaped structure of less than a maximum of 900 Angstroms in diameter, as specified in claims 1-7, 9 and 11.

CONCLUSION

Applicants have responded to each and every rejection raised by the Office and, in concurrence with the Office, consider that claims 1-11 are now in condition for allowance. Applicants request expeditious processing to issuance.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Elmer A. Klavetter". The signature is fluid and cursive, with the first name "Elmer" being more prominent.

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col-or-a-tu-ra (köl'ar-a-tōō'ā, -tyōō'ā) *n.* 1. Florid ornamental trills and runs in vocal music. 2. Music characterized by coloratura. 3. A singer, esp. a soprano, specializing in coloratura. [Obs. Ital. < L.Lat., coloring < Lat. *colorare*, to color < *color*, color.]

color bar *n.* Color line.

col-or-blind (köl'ar-blīnd') *adj.* 1. Partially or totally unable to distinguish certain colors. 2. a. Not subject to racial prejudices. b. Not recognizing racial distinctions. —**col-or-blind-ness** *n.*

col-or-breed (köl'ar-brēd') *tr.v.* -bred (-brēd'), -breed-ing, -breeds. To breed (plants or animals) selectively to produce new or desired colors.

col-or-cast (köl'ar-kāst') *v.* -cast or -cast-ed, -cast-ing, -casts —*tr.* To broadcast (a television program) in color. —*intr.* To televise in color. —*n.* A television broadcast in color. [COLOR + (BROAD)CAST.]

col-or-code (köl'ar-kōd') *tr.v.* -cod-ed, -cod-ing, -codes. To color, as wires or papers, according to a code for easy identification.

col-ored (köl'ard) *adj.* 1. Having color. 2. a. Of an ethnic group not regarded as Caucasian, esp. Negro. b. Of mixed racial strains. 3. Distorted or biased, as by irrelevant or incorrect information. —*n.* A colored person or persons.

col-or-fast (köl'ar-fāst') *adj.* Having color that will not run or fade with washing or wear: a *colorfast fabric*. —**col-or-fast-ness** *n.*

color filter *n.* A photographic filter used to increase contrast or take photographs through haze.

col-or-ful (köl'ar-fəl) *adj.* 1. Full of color; abounding in colors. 2. Characterized by rich variety; vivid; distinctive: *colorful language*. —**col-or-ful-ly** *adv.* —**col-or-ful-ness** *n.*

color guard *n.* The ceremonial escort for the flag, as of a country or organization.

col-or-if-ic (köl'ar-if'ik) *adj.* Producing or imparting color.

col-or-im-e-ter (köl'ar-im'ē-tēr) *n.* 1. Any of various instruments used to determine or specify colors, as by comparison with spectroscopic or visual standards. 2. An instrument that measures the concentration of a known solution constituent by comparison with colors of standard solutions of that constituent. —**col-or-im-e-tric** (-ar-a-mē't'rik) *adj.* —**col-or-im-e-tri-cal-ly** *adv.* —**col-or-im-e-try** *n.*

coloring (köl'ar-ing) *n.* 1. The art, manner, or process of applying color. 2. A substance used to color something. 3. Appearance with regard to color. 4. Characteristic aspect, tone, or style. 5. False or misleading appearance.

col-or-ist (köl'ar-ist) *n.* 1. A painter skilled in achieving special effects with color. 2. A hairdresser who specializes in dyeing hair. —**col-or-ist-ic** *adj.*

col-or-less (köl'ar-lis) *adj.* 1. Without color. 2. Weak or dull in color; pallid. 3. Lacking animation, variety, or distinction; uninteresting; dull: a *colorless candidate*. —**col-or-less-ly** *adv.* —**col-or-less-ness** *n.*

color line *n.* A barrier, created by custom, law, or economic differences, separating nonwhite persons from whites.

col-los-sal (köl-lōs'al) *adj.* Enormous in size, extent, or degree; gigantic; tremendous. [Fr. < Lat. *colossus*, colossus.] —**col-los-sal-ly** *adv.*

col-los-se-um (köl'ā-sē'um) *n.* Variant of *coliseum*.

col-los-si (köl-lōs'tī) *n.* A plural of *colossus*.

Co-los-sians (köl-lōsh'anz, -lōs'ē-anz) *n.* (used with a sing. verb). See table at *Bible*.

col-los-sus (köl-lōs'as) *n., pl.* -los-si (-lōs'tī) or -los-sus-es. 1. A huge statue. 2. Something likened to a colossus, as in size or importance. [Lat. < Gk. *kolossos*.]

col-los-to-my (köl-lōs'tō-mē) *n., pl.* -mies. The surgical construction of an artificial excretory opening from the colon.

col-los-trum (köl-lōs'trūm) *n.* The first milk secreted by the mammary glands immediately after childbirth, lasting for a few days. [Lat.]

col-our (köl'ar) *n. & v.* Chiefly Brit. Variant of *color*.

-colous *suff.* Having a specified kind of habitat: *arenicolous*. [Lat. *-cola*, inhabitant.]

col-pi-tis (köl-pī'tis) *n.* Inflammation of the vaginal mucous membrane. [Gk. *kolpos*, vagina + -ITIS.]

col-port-age (köl'pōr'tij, -pōr'-) *n.* The work of a colporteur.

col-port-eur (köl'pōr'tēr, -pōr'-) *n.* A peddler of devotional literature. [Fr., alteration of OFr. *comporteur* < *comporter*, to peddle, conduct. —see *COMFORT*.]

col-po-scope (köl'pō-skōp') *n.* A speculum that is used in the diagnostic examination of the vaginal and cervical tissues. [Gk. *kolpos*, vagina, womb + -SCOPE.]

col-po-s-co-py (köl-pōs'kō-pē) *n., pl.* -pies. The examination of the vaginal and cervical tissues by means of a colposcope. [Gk. *kolpos*, vagina, womb + -SCOPY.]

colt (köl't) *n.* 1. A young male horse. 2. A youthful or inexperienced person; a novice or beginner. 3. A rope whip formerly used for shipboard discipline. [ME < OE.]

col-ter also **coul-ter** (köl'tēr) *n.* A blade or wheel on a plow for making vertical cuts in the sod. [ME < OE *culter* ult. < Lat.]

colt-ish (köl'tish) *adj.* 1. Of, pertaining to, or like a colt. 2. Lively and playful; frisky. —**colt-ish-ly** *adv.* —**colt-ish-ness** *n.*

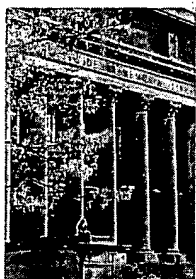
colts-foot (költs'fōot') *n., pl.* -foots. A plant, *Tussilago farfara*, native to the Old World, having yellow flowers that



colt



columbine



column

appear before the heart-shaped leaves. [From the shape of its leaves.]

col-u-brid (köl'ā-brīd, köl'yā-) *n.* Any of numerous chiefly nonvenomous snakes of the family Colubridae, which includes the king snakes and garter snakes. —*adj.* Of or belonging to the Colubridae. [NLat. *Colubridae*, family name < Lat. *coluber*, snake.]

col-u-brine (köl'ā-brīn, köl'yā-) *adj.* Colubrid.

col-u-go (köl-lō'gō) *n., pl.* -gos. The flying lemur. [Malay.]

Co-lum-ba (köl-lūm'bā) *n.* A constellation in the Southern Hemisphere near Caelum and Puppis. [NLat. < Lat. *lumba*, dove.]

col-um-bar-i-um (köl'ām-bār'ē-um) also **col-um-bar** (köl'ām-bēr'ē) *n., pl.* -i-a (-ē-ā) also -ies. 1. a. A vault with niches for urns containing ashes of the dead. b. One of the niches in such a vault. 2. a. A doveote. b. A pigeonhole; a doveote. [Lat., sepulchre for urns; doveote < *columba*, dove.]

Co-lum-bi-a (köl-lūm'bē-ā) *n.* A feminine personification of the United States. [After Christopher Columbus (1451-1506), its discoverer.]

Co-lum-bi-an (köl-lūm'bē-ān) *adj.* 1. Of or pertaining to the United States. 2. Of or pertaining to Christopher Columbus.

col-um-bine (köl'ām-bīn) *n.* Any of several plants of the genus *Aquilegia*, having variously colored flowers with conspicuously spurred petals. —*adj.* Dovelike. [ME < M.Lat. *columbina* < Lat. *columbinus*, dovelike (from the resemblance of the inverted flower to a cluster of doves) < *columba*, dove.]

col-um-bite (köl-lūm'bīt') *n.* A black mineral, essentially (Fr. Mn)(Nb, Ta)₂O₆, used as a source of niobium and tantalum. [COLUMBIUM + -ITE.]

col-um-bi-um (köl-lūm'bē-um) *n.* Symbol *Cb* Niobium. [NLat. *Columbia*, the United States.]

Columbus Day *n.* October 12, a holiday celebrated officially on the second Monday in October in the United States in honor of Christopher Columbus.

col-u-mel-la (köl'yā-mē'lā, köl'ā-) *n., pl.* -mē-lae (-mē-lē) Any of several small, columnlike structures in various plants and animals. [Lat., dim. of *columna*, column.] —**col-u-mel-lar** (-mē'lār) *adj.* —**col-u-mel-late** (-mē'lāt') *adj.*

col-umn (köl'um) *n.* 1. A supporting pillar consisting of a base, a cylindrical shaft, and a capital. 2. Something resembling a column in form or function: a *column of mercury*; a *thermometer*. 3. a. One of two or more vertical sections of typed lines lying side by side on a page and separated by a rule or blank space. b. A feature article that appears regularly in a newspaper or other periodical. 4. A formation of troops or vehicles, in which all elements follow one behind the other. 5. *Bot.* An organ formed by the fusion of stamens or of stamens and pistils, as in the orchid. [MLat. *columna* < Lat. *columna*.] —**col-um-ned** (köl'umd) *adj.*

col-um-nar (köl-lūm'nār) *adj.* 1. Having the shape of a column. 2. Constructed with or having columns.

col-um-ni-a-tion (köl-lūm'nē-ā'shən) *n.* The use or arrangement of columns in a building.

col-um-nist (köl'um-nist, -ā-mist) *n.* A writer of a newspaper or magazine column.

col-za (köl'zā, köl'-) *n.* Rape? [Fr. < Du. *koolzaad*, cabbage (< MDu. *cōle* < Lat. *caulis*) + *zaad*, seed < MDu. *saet*.]

com- or **col-** or **con-** *pref.* Together; with; joint; jointly; commingle. [ME < OFr. < Lat.]

co-ma (kō'mā) *n., pl.* -mas. A deep, prolonged unconsciousness, usually the result of injury, disease, or poison. [Gk. *kōma*, *komāi*, deep sleep.]

co-ma (kō'mā) *n., pl.* -mae (-mē). 1. *Astron.* The nebular luminous cloud containing the nucleus and constituting the major portion of the head of a comet. 2. *Bot.* A tuft of hairs, as on some seeds. 3. *Optics.* A diffuse pear-shaped image of a point source. [Lat., hair < Gk. *komē*.] —**co-ma** *adj.*

Coma Ber-eni-ces (bēr'ā-nī'sēz') *n.* A constellation in the northern sky near Boötes and Leo that contains the great cluster of galaxies. [Lat., hair of Berenice.]

co-mae (kō'mē) *n.* Plural of *coma*.

Co-man-che (köl-mān'chē) *n., pl.* *Comanche* or -che-ri. 1. a. A tribe of North American Indians, formerly ranging over the western plains from Wyoming to Texas, now living in Oklahoma. b. A member of this tribe. 2. The Uto-Aztecan language of the Comanche. [Sp. < Ute *kimanche*.] —**Co-man-che** *adj.*

Co-man-che-an (köl-mān'chē-ān) *adj.* Of, belonging to, or designating the geologic time, system of rocks, or sedimentary deposits of the Mesozoic era between the Jurassic and the Upper Cretaceous. —*n.* The Comanchean period. [After *Comanche*, a county in Texas.]

co-mate (kō'māt', kō'māt') also **co-mose** (-mōs') *adj.* Having or resembling a tuft of hairs. [Lat. *comatus*, having long hair < *coma*, hair < Gk. *komē*.]

co-mate (kō'māt', kō'māt') *n.* A mate; companion.

co-ma-tose (kō'mā-tōs', kōm'ā-) *adj.* 1. Of, pertaining to, affected with coma; unconscious. 2. Marked by lethargy; torpid. —**co-ma-tose-ly** *adv.*

co-ma-tu-lid (köl-māch'ā-lid) also **co-ma-tu-la** (-lā) *n.*